

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An air conditioning system comprising: for running a refrigeration cycle by circulating refrigerant through

a compressor;

a first refrigerant circuit provided with a heat-source side heat exchanger, an air heat exchanger, a first four-way selector valve, and a first variable-opening expansion valve; and

a second refrigerant circuit provided with a first adsorption heat exchanger, a second adsorption heat exchanger, a second four-way selector valve, and a second variable-opening expansion valve; wherein

-and a plurality of utilization side heat exchangers and supplying air having passed through the plurality of utilization side heat exchangers to a room to cope with latent heat load and sensible heat load in the room, wherein

the first and second plurality of utilization side heat exchangers include at least one adsorption heat exchangers are exchanger provided with an adsorbent on the surface thereof and the an air heat exchanger is without an adsorbent for exchanging heat between air and refrigerant, the air conditioning system supplies the air having passed through the first or second at least one adsorption heat exchanger to the room to cope with latent heat load in the room and supplies the air having passed through the air heat exchanger to the room to cope with sensible heat load in the room;

the first and second four-way selector valves are controlled for providing a flow passage of refrigerant from the compressor to the air heat exchanger and the heat source side heat exchanger and back to the compressor via the first four-way selector valve, while providing a

flow passage of refrigerant from the compressor to the first and second adsorption heat exchangers and back to the compressor via the second four-way selector valve, and

the refrigerant circuit alternately creates an adsorption action of allowing moisture in the air to adsorb on the first or second at least one adsorption heat exchanger and a regeneration action of allowing moisture to desorb from the first or second at least one adsorption heat exchanger.

2. (Currently amended) The air conditioning system of claim 1, wherein

the first refrigerant circuit is configured to operate in a mode in which the air heat exchanger serves as an evaporator and the heat-source side heat exchanger serves as a condenser or a mode in which the air heat exchanger serves as a condenser and the heat source-side heat exchanger serves as an evaporator.

3. (Withdrawn-Currently Amended) The air conditioning system of claim 2, wherein

the second refrigerant circuit is configured to repeatedly alternate between a mode in which the first or second adsorption heat exchanger serves as an evaporator and a mode in which the first or second adsorption heat exchanger serves as a condenser,

the second refrigerant circuit dehumidifies air in the adsorption action by allowing moisture in the air to adsorb on the first or second adsorption heat exchanger serving as an evaporator and humidifies air in the regeneration action by allowing moisture to desorb from the first or second adsorption heat exchanger serving as a condenser, and

the air conditioning system supplies the air dehumidified or humidified by the first or second adsorption heat exchanger to the room to cope with latent heat load in the room.

4. (Currently Amended) The air conditioning system of claim 2, wherein
~~the plurality of utilization side heat exchangers includes first and second adsorption heat exchangers and the second~~ refrigerant circuit is configured to repeatedly alternate between a mode in which the first adsorption heat exchanger serves as an evaporator and the second adsorption heat exchanger serves as a condenser and a mode in which the first adsorption heat exchanger serves as a condenser and the second adsorption heat exchanger serves as an evaporator,

the second refrigerant circuit dehumidifies air in the adsorption action by allowing moisture in the air to adsorb on the first or second adsorption heat exchanger serving as an evaporator and humidifies air in the regeneration action by allowing moisture to desorb from the first or second adsorption heat exchanger serving as a condenser, and

the air conditioning system supplies the air dehumidified or humidified by the first or second adsorption heat exchanger to the room to cope with latent heat load in the room.

5. (Withdrawn-Currently Amended) The air conditioning system of claim 2, wherein
the second refrigerant circuit ~~includes first and second adsorption heat exchangers and is~~ configured to repeatedly alternate between a mode in which the first adsorption heat exchanger serves as an evaporator and the second adsorption heat exchanger is in non-operating condition and a mode in which the second adsorption heat exchanger serves as an evaporator and the first adsorption heat exchanger is in non-operating condition,

the second refrigerant circuit dehumidifies air in the adsorption action by allowing moisture in the air to adsorb on the first or second adsorption heat exchanger serving as an

evaporator and allows moisture to desorb from the first or second adsorption heat exchanger in non-operating condition in the regeneration action by supplying air to the first or second adsorption heat exchanger in non-operating condition, and

the air conditioning system supplies the air dehumidified by the first or second adsorption heat exchanger serving as an evaporator or the air humidified by the first or second adsorption heat exchanger in non-operating condition to the room to cope with latent heat load in the room.

6. (Withdrawn-Currently Amended) The air conditioning system of claim 2, wherein the second refrigerant circuit ~~includes first and second adsorption heat exchangers and is~~ configured to repeatedly alternate between a mode in which the first adsorption heat exchanger serves as a condenser and the second adsorption heat exchanger is in non-operating condition and a mode in which the second adsorption heat exchanger serves as a condenser and the first adsorption heat exchanger is in non-operating condition,

the refrigerant circuit allows moisture in the air to adsorb on the first or second adsorption heat exchanger in non-operating condition in the adsorption action and humidifies air in the regeneration action by allowing moisture to desorb from the first or second adsorption heat exchanger serving as a condenser, and

the air conditioning system supplies the air dehumidified by the first or second adsorption heat exchanger in non-operating condition or the air humidified by the first or second adsorption heat exchanger serving as a condenser to the room to cope with latent heat load in the room.

7. (Withdrawn-Currently Amended) The air conditioning system of claim 3, switchable between a dehumidification cooling operation for supplying air cooled by the air heat exchanger

and air dehumidified by the first or second adsorption heat exchanger to the room and a humidification heating operation for supplying air heated by the air heat exchanger and air humidified by the first or second adsorption heat exchanger.

8. (Withdrawn-Currently Amended) The air conditioning system of claim 1, wherein the first and second refrigerant circuits are circuit includes only first and second adsorption heat exchangers as said utilization side heat exchangers and is configured to run in an operation in which the first and second adsorption heat exchangers alternately serve as an evaporator while the heat-source side heat exchanger serves as a condenser or an operation in which the first and second adsorption heat exchangers alternately serve as a condenser while the heat-source side heat exchanger serves as an evaporator, and

the air conditioning system supplies air having passed through the first or second adsorption heat exchanger serving as an evaporator or air having passed through the first or second adsorption heat exchanger serving as a condenser to the room to cope with sensible heat load and latent heat load in the room.

9. (Withdrawn-Currently Amended) The air conditioning system of claim 8, wherein the second refrigerant circuit is configured to repeatedly alternate between a mode in which the first adsorption heat exchanger serves as an evaporator and the second adsorption heat exchanger serves as a condenser and a mode in which the first adsorption heat exchanger serves as a condenser and the second adsorption heat exchanger serves as an evaporator, and

the refrigerant circuit dehumidifies air in the adsorption action by allowing moisture in the air to adsorb on the first or second adsorption heat exchanger serving as an evaporator and

humidifies air in the regeneration action by allowing moisture to desorb from the first or second adsorption heat exchanger serving as a condenser.

10. (Withdrawn-Currently Amended) The air conditioning system of claim 8, wherein the second refrigerant circuit is configured to repeatedly alternate between a mode in which the first adsorption heat exchanger serves as an evaporator and the second adsorption heat exchanger is in non-operating condition and a mode in which the second adsorption heat exchanger serves as an evaporator and the first adsorption heat exchanger is in non-operating condition, and

the refrigerant circuit dehumidifies air in the adsorption action by allowing moisture in the air to adsorb on the first or second adsorption heat exchanger serving as an evaporator and allows moisture to desorb from the first or second adsorption heat exchanger in non-operating condition in the regeneration action by supplying air to the first or second adsorption heat exchanger in non-operating condition.

11. (Withdrawn-Currently Amended) The air conditioning system of claim 8, wherein the second refrigerant circuit is configured to repeatedly alternate between a mode in which the first adsorption heat exchanger serves as a condenser and the second adsorption heat exchanger is in non-operating condition and a mode in which the second adsorption heat exchanger serves as a condenser and the first adsorption heat exchanger is in non-operating condition, and

the refrigerant circuit allows moisture in the air to adsorb on the first or second adsorption heat exchanger in non-operating condition in the adsorption action and humidifies air

in the regeneration action by allowing moisture to desorb from the first or second adsorption heat exchanger serving as a condenser.

12. (Withdrawn-Currently Amended) The air conditioning system of claim 9, switchable between a dehumidification cooling operation for supplying air having passed through the first or second adsorption heat exchanger serving as an evaporator to the room and a humidification heating operation for supplying air having passed through the first or second adsorption heat exchanger serving as a condenser.

13. (Withdrawn-Currently Amended) The air conditioning system of claim 1, wherein the first and second refrigerant circuits are circuit is operable in a mode in which the heat-source side heat exchanger and the first or second adsorption heat exchanger concurrently serve as condensers and configured so that during the mode refrigerant flows into the first or second adsorption heat exchanger serving as a condenser after passing through the heat-source side heat exchanger.

14. (Withdrawn-Currently Amended) The air conditioning system of claim 2, wherein the first and second refrigerant circuits are circuit is operable in a mode in which the air heat exchanger and the first or second adsorption heat exchanger concurrently serve as condensers and configured so that during the mode refrigerant flows into the first or second adsorption heat exchanger serving as a condenser after passing through the air heat exchanger serving as a condenser.

15. (Withdrawn-Currently Amended) The air conditioning system of claim 1, wherein the first and second refrigerant circuits are circuit is operable in a mode in which the heat-source side heat exchanger and the first or second adsorption heat exchanger concurrently serve as condensers and configured so that during the mode refrigerant flows into the heat-source side heat exchanger after passing through the first or second adsorption heat exchanger serving as a condenser.

16. (Withdrawn-Currently Amended) The air conditioning system of claim 2, wherein the first and second refrigerant circuits are circuit is operable in a mode in which the air heat exchanger and the first or second adsorption heat exchanger concurrently serve as condensers and configured so that during the mode refrigerant flows into the air heat exchanger serving as a condenser after passing through the first or second adsorption heat exchanger serving as a condenser.

17. (Withdrawn-Currently Amended) The air conditioning system of claim 1, wherein the first and second refrigerant circuits are circuit is operable in a mode in which the heat-source side heat exchanger and the first or second adsorption heat exchanger concurrently serve as evaporators and configured so that during the mode refrigerant flows into the first or second adsorption heat exchanger serving as an evaporator after passing through the heat-source side heat exchanger.

18. (Withdrawn-Currently Amended) The air conditioning system of claim 2, wherein the first and second refrigerant circuits are circuit is operable in a mode in which the air heat

exchanger and the first or second adsorption heat exchanger concurrently serve as evaporators and configured so that during the mode refrigerant flows into the first or second adsorption heat exchanger serving as an evaporator after passing through the air heat exchanger serving as an evaporator.

19. (Withdrawn-Currently Amended) The air conditioning system of claim 1, wherein the first and second refrigerant circuits are circuit is operable in a mode in which the heat-source side heat exchanger and the first or second adsorption heat exchanger concurrently serve as evaporators and configured so that during the mode refrigerant flows into the heat-source side heat exchanger after passing through the first or second adsorption heat exchanger serving as an evaporator.

20. (Withdrawn-Currently Amended) The air conditioning system of claim 2, wherein the first and second refrigerant circuits are circuit is operable in a mode in which the air heat exchanger and the first or second adsorption heat exchanger concurrently serve as evaporators and configured so that during the mode refrigerant flows into the air heat exchanger serving as an evaporator after passing through the first or second adsorption heat exchanger serving as an evaporator.

21. (Currently Amended) The air conditioning system of claim 2, wherein
~~the plurality of utilization side heat exchangers includes first and second adsorption heat exchangers, and~~

the refrigerant circuit comprises a first circuit in which in the first refrigerant circuit, the heat-source side heat exchanger, the a-first variable-opening expansion valve and the air heat exchanger are arranged in series and in the second refrigerant circuit, a second circuit in which the first adsorption heat exchanger, the a-second variable-opening expansion valve and the second adsorption heat exchanger are arranged in series, the first and second refrigerant circuits being connected in parallel with each other.

22. (Withdrawn-Currently Amended) The air conditioning system of claim 3, wherein the first and second refrigerant circuits are circuit is configured so that the refrigerant evaporation temperature in one of the heat-source side heat exchanger and the air heat exchanger which serves as an evaporator and the refrigerant evaporation temperature in the first or second adsorption heat exchanger serving as an evaporator can be set to have different values.

23. (Withdrawn-Currently Amended) The air conditioning system of claim 3, wherein the first and second refrigerant circuits are circuit is configured so that the refrigerant condensation temperature in one of the heat-source side heat exchanger and the air heat exchanger which serves as a condenser and the refrigerant condensation temperature in the first or second adsorption heat exchanger serving as a condenser can be set to have different values.

24. (Withdrawn-Currently Amended) The air conditioning system of claim 1, wherein the air conditioning system includes a heat exchange element for exchanging heat between a first air and a second air, and

at least one of the first and second airs is air for adsorption or air for regeneration before passing through the first or second adsorption heat exchanger.

25. (Withdrawn-Currently Amended) The air conditioning system of claim 1, wherein the flow passage for air for adsorption or air for regeneration passing through the first or second adsorption heat exchanger is provided with a latent heat handling element for coping with latent heat in the air.

26. (Currently Amended) The air conditioning system of claim 4, wherein
wherein the refrigerant circuit further includes:

the a-first four-way selector valve changes for changing a flow passage of refrigerant to switch between a state in which the air heat exchanger serves as an evaporator and the heat-source side heat exchanger serves as a condenser and a state in which the air heat exchanger serves as a condenser and the heat-source side heat exchanger serves as an evaporator; and

the a-second four-way selector valve changes for changing a flow passage of refrigerant to switch between a state in which the first adsorption heat exchanger serves as an evaporator and the second adsorption heat exchanger serves as a condenser and a state in which the first adsorption heat exchanger serves as a condenser and the second adsorption heat exchanger serves as an evaporator.

27. (Currently Amended) The air conditioning system of claim 21,
wherein the a-first four-way selector valve for changing a flow passage of refrigerant to switch between a state in which the air heat exchanger serves as an evaporator and the heat-source side heat exchanger serves as a condenser and a state in which the air heat exchanger serves as a condenser and the heat-source side heat exchanger serves as an evaporator is connected to the first refrigerant circuit; and
the a-second four-way selector valve for changing a flow passage of refrigerant to switch between a state in which the first adsorption heat exchanger serves as an evaporator and the second adsorption heat exchanger serves as a condenser and a state in which the first adsorption heat exchanger serves as a condenser and the second adsorption heat exchanger serves as an evaporator is connected to the second refrigerant circuit.

28. (Currently Amended) The air conditioning system of claim 21, wherein
~~the refrigerant circuit is provided with a compressor, a first four-way selector valve and a second four-way selector valve,~~
the first four-way selector valve is configured such that a first port of the first four-way selector valve is connected to a discharge side of the compressor, a second port of the first four-way selector valve is connected to a suction side of the compressor, a third port of the first four-way selector valve is connected to one end of the first refrigerant circuit, and a fourth port of the first four-way selector valve is connected to one other of the first refrigerant circuit,

the first four-way selector valve switches between a position in which the first and third ports communicate and the second and fourth ports communicate, and another position in which the first and fourth ports communicate and the second and third ports communicate,

the second four-way selector valve is configured such that a first port of the first four-way selector valve is connected to a discharge side of the compressor, a second port of the first four-way selector valve is connected to a suction side of the compressor, a third port of the first four-way selector valve is connected to one end of the second refrigerant circuit, and a fourth port of the first four-way selector valve is connected to one other of the second refrigerant circuit, and

the second four-way selector valve switches between a position in which the first and third ports communicate and the second and fourth ports communicate, and another position in which the first and fourth ports communicate and the second and third ports communicate.